

such as a study by the University of Hawaii (UH) Secretariat for Conservation Biology that estimated the value of ecosystem services, to quantify the benefits of critical habitat. Conversely, another commenter stated that the alleged benefits are entirely speculative and unquantifiable, and that the listed plants are of no use to anyone and lack commercial value. Another commenter points out that according to the DEA summary of costs and benefits, the benefits of designating critical habitat are "difficult to estimate" and are exceeded by the costs. Accordingly, the Service should exclude areas covered by the DEA from designation.

*Our Response:* There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop 1978, 1980; Brookshire and Eubanks 1983; Boyle and Bishop 1986; Hageman 1985; Samples *et al.* 1986; Stoll and Johnson 1984). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lilieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

Chapter VI, Section 6 of the DEA discusses potential benefits, both direct and indirect, that can result from the proposed designation. The DEA notes that the proposed designation can create ecological and cultural benefits such as the ones mentioned in the above comment—e.g., ethnobotanical value of plants to the Native Hawaiians and social welfare benefits of ecological improvements. However, the DEA also indicates that these benefits are not quantified due to lack of information available on: (1) Quantified data on the value of the Maui and Kahoolawe species, and (2) quantified data on the change in the quality of the ecosystem and the species as a result of the designation. The DEA, however, does not conclude that the benefits are exceeded by the costs. Instead, it discusses the benefits that could result from critical habitat designation in qualitative terms.

While section 4(b)(1)(A) of the Act stipulates that listing determinations must be made solely on the basis of biological evidence, section 4(b)(2) of the Act, which calls for the establishment of critical habitat for all listed species if it is prudent and

determinable, adds that the Secretary should take into consideration the economic impact of the designation and any other relevant impacts before specifying any particular area as critical habitat. Hence, an economic analysis is part of the process of designating critical habitat. Section 4(b)(2) of the Act provides the Secretary with broad discretion to take into consideration the economic impacts of any proposed critical habitat designation and exclude areas where she finds that the benefits of exclusion outweigh the benefits of designation.

The Secretary may exclude any area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless she determines, based on the best scientific and commercial data available, the failure to designate such area as critical habitat will result in the extinction of the species concerned (16 U.S.C. 1533(b)(2)).

Thus, the Secretary is not required to find that the benefits of inclusion outweigh the costs of inclusion before designating an area, nor is the Secretary required to exclude an area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of inclusion. Rather, the Act provides the Secretary with the discretion to take economic and other considerations into account when designating critical habitat.

As such, the DEA and the Addendum serve to illustrate possible impacts that can result from the designation, whether in the form of costs or benefits. However, the DEA and the Addendum are not intended to provide a comprehensive analysis of the benefits that could result from section 7 of the Act in general, or of critical habitat in particular. In short, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected costs of the rulemaking. The DEA and the Addendum simply provide information for the Secretary to exercise her discretion, but do not provide definitive conclusions or recommendations as to what areas, if any, should be excluded from the final designation.

Finally, although the UH study does value ecosystem services, it has limited applicability for valuing the benefits of the proposed critical habitat designation for the plants for a number of reasons. First, the UH study had a different purpose, which was to estimate the total value of environmental benefits provided by the entire Ko'olau Mountains on the island of Oahu versus

the value of the more limited benefits provided by the proposed critical habitat for the plants on the islands of Maui and Kahoolawe. Consistent with its purpose, the UH study provided no estimates of the changes in environmental conditions resulting from changes in land and stream management due to critical habitat designation.

Furthermore, many of the assumptions and much of the analysis in the UH study are not transferable to the economic analysis for the plants' critical habitat. For example, the value of water recharge in the UH study reflects projected water supply and demand conditions on Oahu—an island  $\frac{3}{4}$  of the size of Maui but with a population of nearly ten times that of Maui. Also, the UH benefit analysis of reducing soil runoff is unique to three valleys that drain through partially channelized streams in urban areas into the manmade Ala Wai Canal. Since this canal was designed with inadequate flushing from stream or ocean currents, it functions as an unintended settling basin that must be dredged periodically. In addition, the recreational and ecotourism values provided in the UH study apply to areas that are accessible to most hikers, which is not the case with significant portions of the plants' critical habitat. Significant portions of the plants' critical habitat units are in mountainous range with steep slopes and difficult access and on coastal cliffs.

(48) *Comment:* Critical habitat does not benefit ecotourism by creating new special places for people to visit, as the DEA suggests. Rather, it helps to protect the special places that already exist from degradation, ensuring that they will be around in the future to attract future ecotourists. Moreover, the Service's subjective preference that commercial operators not feature visits to view threatened and endangered plants has no place in an objective economic analysis.

*Our Response:* Chapter VI, Section 6.b.(1) of the DEA indicates that the proposed critical habitat may enhance the appeal of ecotourism by providing a marketing dimension. However, the DEA also states that this benefit may be slight since these places may already be regarded as special due to the existing natural and cultural resources in the area.

(49) *Comment:* The DEA underestimates economic costs because they are limited to what is likely to occur within 10 years. Critical habitat designation is permanent and not automatically revised if there is new evidence of the benefits of